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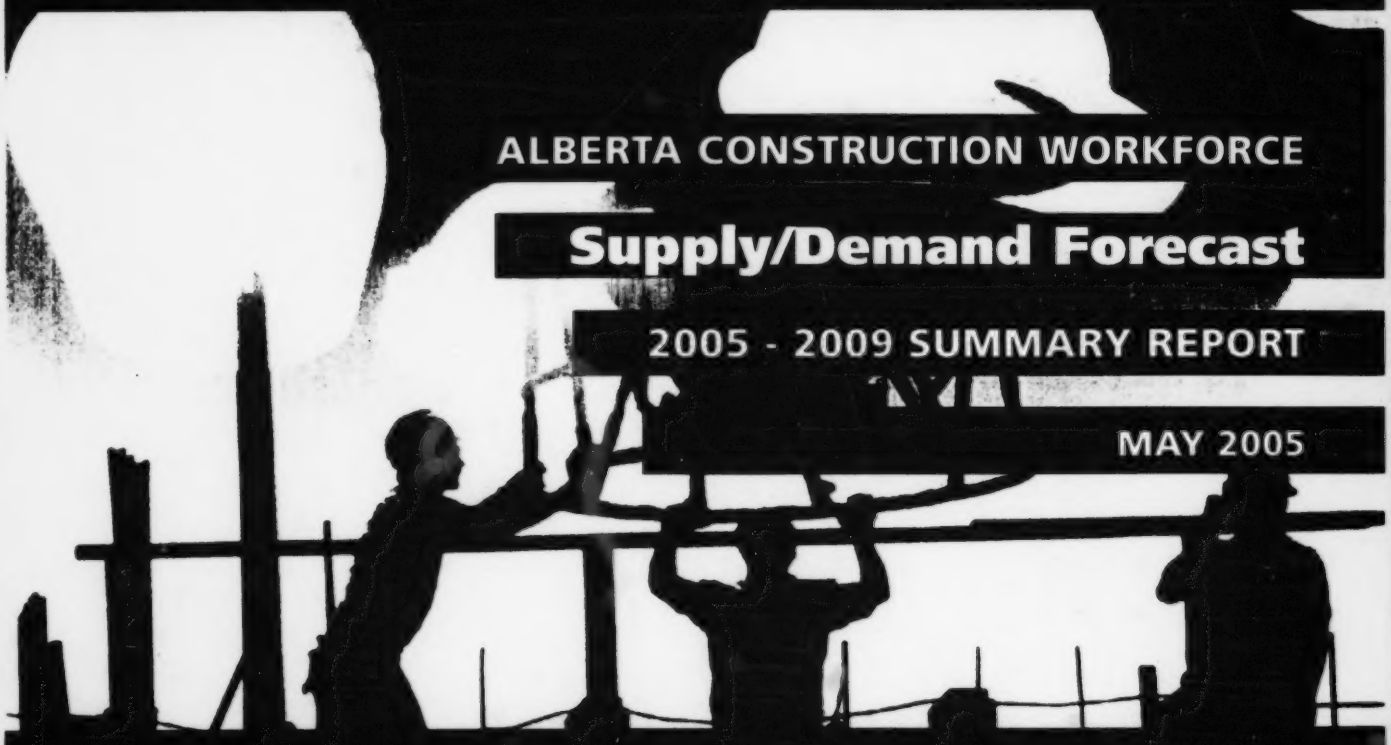

ALBERTA CONSTRUCTION WORKFORCE

Supply/Demand Forecast

2005 - 2009 SUMMARY REPORT

MAY 2005

A COLLABORATIVE EFFORT INVOLVING

The Alberta Construction Contractors and Labour Organizations ■ The Construction Owners Association of Alberta ■ Alberta Advanced Education ■ Alberta Human Resources and Employment ■ Alberta Economic Development

106-06885/

Construction Workforce Development Forecasting Committee (CWDFC)

A Construction Best Practices Initiative of the Construction Owners Association of Alberta

Trades Demand and Supply Forecast: Industrial and Engineering Construction Related Trades

2005

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1. Introduction

This report describes the Construction Workforce Development Forecasting Committee's (CWDFC) annual forecast for trades working largely in engineering and industrial construction in the province. The forecast is conducted as a Construction Best Practices initiative under the auspices of the Construction Owners Association of Alberta. For a list of all participating partners in the Forecast please see the Appendix at the back of this report. The forecast period in this year's report covers the years 2005 through to 2009.

The forecast shows a construction cycle similar to that encountered over the 1998 to 2003 period, but with a higher peak in the demand for construction workers than that observed in 2001. There is a sharp increase in the demand for the trades over the next three years followed by an easing in demand growth in 2008 and a decline in 2009. During the early part of the period, supply is not able to keep up with demand making it difficult to find workers in a number of trades. As supply catches up with demand this difficulty is alleviated in 2009.

The current engineering and industrial construction cycle is driven largely by oil sands projects in the Fort McMurray area, related projects in other areas of the province and increases in government infrastructure investment. The total value of investment associated with the oil sands projects in the forecast period is $33 billion after adjustment for inflation, with a peak of $8.2 billion occurring in 2008. The major project list shows a noticeable increase in announced investment expenditures in 2005 relative to that for 2004.

There is a significant increase in the construction industry employment in the province over the next three years with total construction related employment exceeding 180 thousand in 2008. Trades working on industrial and engineering projects show the strongest growth. While the supply of trades increases strongly over the period, there is likely to be significant difficulty in finding pipefitters, industrial electricians, boilermakers, ironworkers and crane operators in the province. Additional workers will need to be obtained from outside the province to meet the requirements of the construction industry.

The next section of the report presents the economic environment facing the construction industry. The third section describes the outlook for investment spending. The fourth section examines the demand and supply situation for the trades in the construction industry. The fifth section examines the likely sources of workers outside the construction industry in the province and outside the province and presents the CWDFC rankings for the trades. The final section provides concluding remarks on the findings in the report.

2. Economic Outlook

The economic environment facing the construction industry determines both the supply and demand for construction trades through its impact on investment, employment, and the labour force. This environment includes the economic performance of both the provincial economy itself, and that of its trading partners.

The assumptions for the rest of the world are derived from economic outlooks produced by such organizations as the World Bank and the International Monetary Fund. **These assumptions were assembled at the end of 2004 and reflect the views of the performance of the world economy held at that time.** The assumptions for the domestic economic environment are obtained from predictions of a macroeconomic model of the provincial economy that incorporates the external environment assumptions. The latest historical economic data employed are those published by Statistics Canada to December 2004.

External Environment

The external environment facing the province in the outlook is a positive factor behind the province's expected economic performance. The assumptions for this environment are shown in Table 2.1. They may be summarized as follow:

- Commodity price inflation eases over the projection period, but price levels are assumed to remain higher than previously anticipated by almost all commodity price forecasters. A strong and growing demand for commodities on the part of the Chinese economy is a major factor behind this assumption;

- Economic growth in the United States, one of the province's largest trading partners, averages 2.9 percent over the forecast period, while growth in the Canadian economy averages 2.7 percent;

- Inflation in the United States and Canada remains low, resulting in short-term interest rates also staying low, although they rise over the medium term to restore more reasonable levels with respect to inflation. A rising Canadian dollar and weaker economic growth in Canada allow Canadian interest rates to rise at a slower pace than those in the United States;

- The Canadian dollar appreciates from almost $U.S. 0.77 in 2004 to 0.83 in 2009. This appreciation reflects a better inflation and federal government and trade balance performance in Canada relative to the United States, and;

- Federal and provincial government fiscal policy is assumed to be expansionary over the forecast period, with the federal government registering the fastest spending growth. No additional tax reductions are assumed to take place during the projection period other than those announced in recent budgets.

Table 2.1
Key Economic Indicators
Rest of World and Alberta

	2005	2006	2007	2008	2009
United States					
Real GDP Growth (%)	3.4	3.0	3.0	2.8	2.5
GDP Deflator Inflation (%)	1.8	1.5	1.5	1.5	1.5
3 Month Treasury Bill Rate (%)	3.0	4.0	4.0	4.0	4.0
Canada					
Real GDP Growth (%)	2.4	2.8	3.0	2.6	2.4
GDP Deflator Inflation (%)	1.5	0.9	1.2	1.1	1.4
3 Month Treasury Bill Rate (%)	2.9	3.6	4.0	3.8	3.9
Exchange Rate $US	0.81	0.82	0.82	0.83	0.83
Alberta					
(Growth Rates %)					
Real GDP	3.0	3.5	4.1	2.8	2.1
Consumer Expenditures	3.4	4.3	4.8	3.9	3.4
Government Consumption Expenditures	3.2	2.4	2.6	2.7	2.7
Government Investment Expenditures	7.5	8.5	6.4	1.3	2.3
Business Investment Expenditures	6.6	6.9	3.0	1.9	-2.6
Exports	2.7	2.8	4.9	2.8	3.3
Imports	3.9	4.9	4.7	3.4	2.1
Population	1.3	1.4	1.5	1.6	1.4
Employment	2.0	1.5	2.4	1.2	0.8
Labour Force	1.7	1.7	1.9	1.8	1.4
Unemployment Rate (Level %)	4.3	4.5	4.0	4.5	5.1
CPI	1.6	1.6	1.7	1.6	1.6
Average Hourly Earnings	3.8	3.8	4.4	3.6	2.9

*Growth rates are averages for the period, while levels are 2013 values
Source: Statistics Canada and the Construction Sector Council

Provincial Outlook

The outlook for the key indicators of the province's economic performance is shown in Table 2.1.

- Economic growth weakens somewhat in 2005, as the economy adjusts to a stronger exchange rate, but strengthens in 2006 and beyond to average over 3.0 percent for the forecast period as a whole;

- The major source of growth in the economy in the medium term is a strong investment performance. The main factors behind this strong performance include

the large amount of investment scheduled for oil sands development and strong growth in government capital spending. This investment performance combined with strong growth in government current expenditures leads to rapid growth in consumer expenditures;

- The strong output performance of the economy causes employment growth to average 1.6 percent in the medium term, with productivity growth averaging 1.5 percent. The unemployment rate averages 4.5 percent over the forecast period;

- Low import price inflation and good labour productivity growth cause CPI inflation to average just over 1.6 percent. A tightening labour market, inflation, and productivity growth cause average hourly earnings to rise on average 3.7 percent per year, and;

- The stronger economic performance results in an increase in net in-migration to the province. Additional migrants are needed to facilitate employment growth, because the rate of growth in the population without migration – the natural rate of growth – is almost zero. With the additional migrants, population growth averages 1.4 percent.

3. Investment Outlook

The outlook for investment in the province is the key driver for the demand for construction trades. The current outlook shows a slowdown in the rate of growth in residential investment and a sharp strengthening in non-residential investment, particularly in the engineering and industrial building construction sectors.

Major Industrial Projects

An important set of information behind the outlook for non-residential investment and associated trades requirements is a list of major projects underway or planned for construction in the province. Economic models have difficulty in accurately predicting the occurrence, lumpiness and exact timing of construction expenditures and the associated number and types of trades required. The use of project information is an attempt to improve the accuracy of the outlook for the economy and trades requirements.

The major project list compiled by the CWDFC using the February 2005 Alberta Economic Development project list is shown in Table 3.1 – **the projects in the current forecast do not include those announced after the publication of the February list.** It also contains the CWDFC project lists for the two years. The value of projects increased over 20 per cent from 2004, while the number of projects increased much less rapidly. The increase in the value of projects is a result of the sharp increase in oil, gas, and oil sands projects.

Table 3.1
CWDFC Major Project List

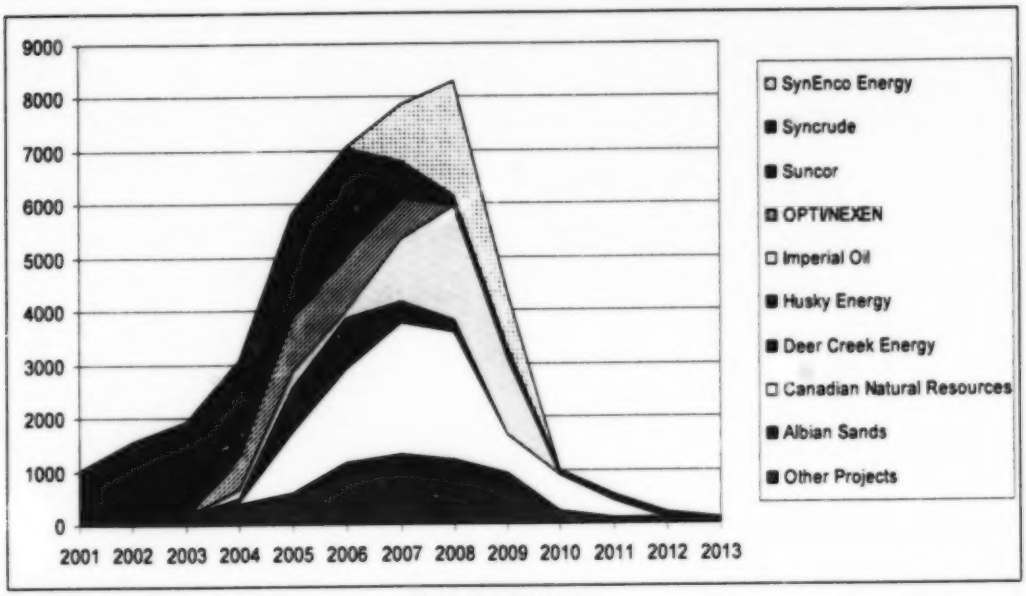
	2003 Project List		2004 Project List		2005 Project List	
Sector	No. of Projects	Investment Expenditures ($ millions)	No. of Projects	Investment Expenditures ($ millions)	No. of Projects	Investment Expenditures ($ millions)
Mining	1	$30	2	$39	6	$368
Oil, Gas & Oil Sands	48	$52,401	56	$51,409	61	$68,627
Forest Products	4	$170	5	$431	7	$797
Chemicals	2	$46	3	$38	5	$128
Other Manufacturing	27	$290	27	$295	41	$709
Pipelines	11	$2,369	23	$1,577	36	$2,140
Other Commercial	226	$12,057	283	$13,613	282	$10,193
Infrastructure & Institutions	290	$10,087	410	$12,553	398	$15,874
Total	609	$77,450	809	$79,955	836	$98,835

Source: CWDFC and Alberta Economic Development

The largest amount of major industrial project investment in the province is related to oil sands development in the Fort McMurray area. There are about 30 oil sands projects under construction or scheduled for development in this area. Figure 3.1 shows a stacked area chart of the investment value of the projects adjusted for inflation. Companies with

a relatively large amount of investment are identified separately, while the "Other Projects" category contains the total value of investment for the remaining companies. The order of the companies in the chart follows that of the legend.

Figure 3.1
Major Oil Sands Investment



($1997 Millions)

Source: CWDFC and Alberta Economic Development

The total value of investment associated with these projects in the forecast period, 2005 to 2009, is $33 billion after adjustment for inflation. The peak level of investment occurs in 2008 at $8.2 billion. In 2009, announced project investment falls to $4.4 billion.

It should be noted here that the dramatic fall-off in oil sands investment shown in Figure 3.1 does not mean that oil sands investment will actually fall $4.4 billion in 2009. In the forecast it is assumed that there will be another round of oil sands investment with a cycle similar to that which occurred after the 2001 peak. The year 2009 in the forecast is the beginning of a temporary downturn in oil sands investment – see the engineering construction investment forecast in Figure 3.2.

In the manufacturing sector a number of projects are located in the Edmonton area. These projects include the expansion of the Shell Scotford Refinery and the proposed Heartland and Northwest upgraders in addition to sulphur reduction projects at Imperial Oil and Shell. Petro Canada is also upgrading its facility to reduce sulphur and converting its refinery to be able to refine oil sands crude.

Other manufacturing projects outside Edmonton include the Tolko wood products mill and the hardwood sawmill plant of Ainsworth Lumber in Greenview, and the CO_2 extraction plants of Ferus Gas Industries in Grande Prairie and Empress. In addition, there is a number of food processing plants scheduled for construction. These plants include a meat packing plant in Pincher Creek and beef processing plant in Calgary.

Major projects in pipeline construction include the Taylor NGL/Nova NGL line in Fort Saskatchewan, Shell Canada's interconnect pipeline near Rocky View, Suncor's sour gas and fuels pipeline in Greenview, and AOSPL's pipeline loops in Athabasca and Lamont. Tereasen, TransCanada, and Enbridge are also proposing to build pipelines portions of which would be built in Alberta. Located just North of Alberta is the proposed MacKenzie Valley Pipeline which, although not built in Alberta, could utilize a significant number of Alberta workers providing it can iron out issues with native groups in the area.

Electric power projects include the Luscar Bow City Power Project near Brooks, the Hunt Power gas-fired plant in Rocky View, and the Glacier Power hydroelectric weir near Dunvegan. Cogeneration plants include those of Sundance Forecast Industries and Talisman Energy in Yellowhead County and Canadian Hydro Developers in Grande Prairie. It is also interesting to note that there are over $200 million worth of wind power projects proposed, most of which are located in the Pincher Creek area.

Non-Residential Investment

Table 3.2 shows the outlook for residential and non-residential construction expenditures by construction sector. The investment values are adjusted for inflation. The historical data are obtained from Statistics Canada.

Figure 3.2 shows engineering and industrial building construction investment expenditures. The value of major oil sands projects is largely found under engineering construction. Engineering investment also includes utility and government infrastructure investment. Investment in the agriculture and manufacturing sectors accounts for the largest amount of investment in the industrial building category.

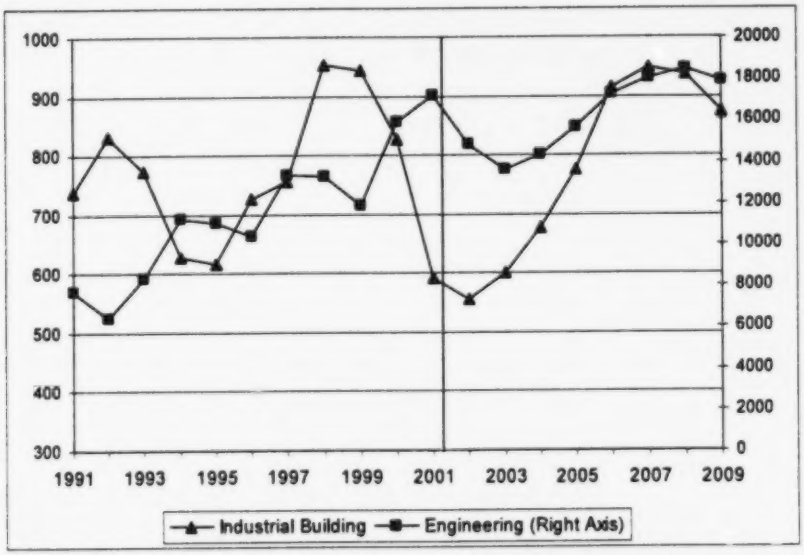
Industrial building construction expenditures have generally declined over the past few years. Such investment is expected to recover sharply over the forecast period in line with increased agriculture and manufacturing investment. The major manufacturing projects causing this increase were described above.

After rising rapidly to 2000, engineering construction declined in 2002 and 2003 in line with oil and gas investment, in particular, oil sands investment. The increase in oil sands and utility investment along with significant increases in government infrastructure investment causes engineering construction to rise rapidly to 2008. In 2009, investment falls slightly as oil sands investment declines.

Commercial building construction rises over the forecast period in line with increased business activity and population growth. Institutional and government building

construction is driven by rapid increases in government expenditures associated with provincial plans to expand the province's infrastructure and federal-provincial infrastructure programs.

Figure 3.2
Engineering and Industrial Building Construction Investment
($1997 Millions)



Source: Statistics Canada, Construction Sector Council, and CWDFC

Table 3.1
Investment Expenditure Outlook

	2003	2004	2005	2006	2007	2008	2009
Housing Starts (000s)	36.2	33.7	29.2	28.5	28.7	29.8	29.0
% Change	-6.7	-6.8	-13.4	-2.4	0.6	4.0	-2.9
Residential Investment ($97 Millions)	6288	6105	5638	5620	5742	5962	5912
% Change	1.2	-2.9	-7.7	-0.3	2.2	3.8	-0.8
New Housing	4272	3981	3449	3366	3388	3525	3424
% Change	-0.4	-6.8	-13.4	-2.4	0.7	4.1	-2.9
Renovations	2016	2124	2190	2253	2354	2436	2488
% Change	4.6	5.4	3.1	2.9	4.4	3.5	2.1
Nonresidential Investment ($97 Millions)	32567	34847	38056	41222	42671	43309	42271
% Change	-6.0	7.0	9.2	8.3	3.5	1.5	-2.4
Engineering Construction	13568	14268	15614	17263	18005	18479	17855
% Change	-8.3	5.2	9.4	10.6	4.3	2.6	-3.4
Building Construction	2538	2789	3042	3210	3308	3342	3328
% Change	-9.8	9.9	9.1	5.5	3.0	1.1	-0.4
Industrial Construction	601	678	776	914	948	936	875
% Change	8.1	12.7	14.5	17.8	3.7	-1.2	-6.5
Commercial Construction	929	1028	1071	1019	1050	1073	1088
% Change	5.2	10.7	4.2	-4.9	3.0	2.2	1.4
Institutional & Government Construction	1102	1176	1288	1370	1403	1426	1457
% Change	-23.7	6.7	9.5	6.3	2.4	1.7	2.2
Machinery & Equipment	16461	17790	19400	20749	21358	21487	21088
% Change	-3.4	8.1	9.0	7.0	2.9	0.6	-1.9

*Growth rates refer to average period growth, levels to the 2013 value
Source: Statistics Canada and the CSC

Residential Investment

Residential building investment expenditures adjusted for inflation have grown very rapidly over the past few years in line with stronger household growth, rising incomes, and lower interest rates. While interest rates rise over the forecast period, continued income and population growth cause starts to average just below 30 thousand units. New housing investment moves in line with housing starts, while renovation investment expenditures register continued strong growth.

4. Construction Industry Trades Demand and Supply

This section presents the outlook for employment, labour force, and the supply-demand balance for trades in the construction industry. The demand for the trades rises at a more rapid rate than supply in the short term, but supply increases faster than demand in the latter part of the forecast period, as investment activity and demand growth slow. For a number of trades, supply closely associated with the industry will not be sufficient to meet demand during the first three years of the forecast period.

The demand for construction trades working in the construction industry is estimated as the sum of requirements across four major construction sectors: (1) low-rise residential; (2) high-rise residential, commercial, government and institutional; (3) engineering, and (4) industrial. In addition, requirements are estimated separately for selected trades for major industrial projects such as oil sands projects. These estimates are presented below.

The supply of trades to the construction industry consists of trades closely associated with the industry and those working in other industries. The latter persons must be able and willing to work in construction to represent actual supply. This section presents forecasts of the supply of workers closely associated with the construction industry. The availability of workers from other industries and their implication for the overall supply-demand balance is discussed in the next section.

Changes in the supply of construction trades are determined to a large extent by changes in the demand for trades. In addition, changes in the size and age distribution of the current construction labour force and the growth of the overall labour force are also important determinants. Changes in the overall labour force are the potential source of workers for the construction industry. An important determinant of overall labour force growth is migration to the province.

Major Industrial Project Employment Requirements

An important set of information that assists with the preparation of the overall forecast for trades contains estimates of the employment requirements for major industrial projects in the province. These estimates are prepared from the major industrial project list for projects valued in excess of $50 million. They are shown in Table 4.1.

The estimated number of workers required for the announced projects rises from 18.6 thousand in 2005 to 24.1 thousand in 2008 and falls to 8.8 thousand in 2009. Again it should be noted that employment requirements do not fall off this sharply in the forecast as additional oil sands investment is assumed to occur thereby offsetting the announced projects – see the discussion of major project investment above. The total person-years of employment for the period 2005 to 2009 are 94.8 thousand. The requirements are largest for plumbers-pipe fitters and electricians.

It should be noted that increases in the demand for individual trades do not always match changes in investment expenditures. The reason for this situation is that individual trades are used at different intensities at different times over the life of a project. Some trades

may be used more intensively at the beginning of a project while others may be used near the end of the project. The differing time profiles of the projects, which are shown in Figure 3.1, are aggregated up across the various projects in Table 4.1 and can produce counterintuitive results. For example, while project investment peaks in 2008, the demand for boilermakers and bricklayers actually falls.

Table 4.1
Employment Requirements (000s)
Industrial Projects Valued $50 Million and Over

	2005	2006	2007	2008	2009	2005-2009
Boilermakers	0.53	0.49	0.63	0.32	0.18	2.15
Bricklayers	0.23	0.19	0.24	0.07	0.04	0.75
Carpenters	1.18	1.25	1.41	2.00	0.62	6.47
Electricians	1.60	2.03	2.33	2.57	1.07	9.61
Insulators	0.94	1.05	1.44	1.15	0.58	5.16
Ironworkers	1.40	1.77	1.78	1.76	0.62	7.33
Labourers	1.60	1.62	1.95	2.65	0.64	8.46
Millwrights	0.50	0.43	0.43	0.29	0.10	1.75
Operating Engineers	1.45	1.61	1.94	2.09	0.78	7.86
Plumbers-Pipe Fitters	2.70	3.46	3.82	3.95	1.78	15.70
Sheet Metal Workers	0.99	1.12	1.38	1.54	0.42	5.44
Welders	0.85	0.86	0.94	1.08	0.43	4.15
Other Occupations	4.67	4.58	4.52	4.58	1.56	19.92
Total	18.63	20.46	22.80	24.05	8.80	94.75

Source: CWDFC
Note: the last column is an aggregate of the other five columns.

Trades Employment and Labour Force

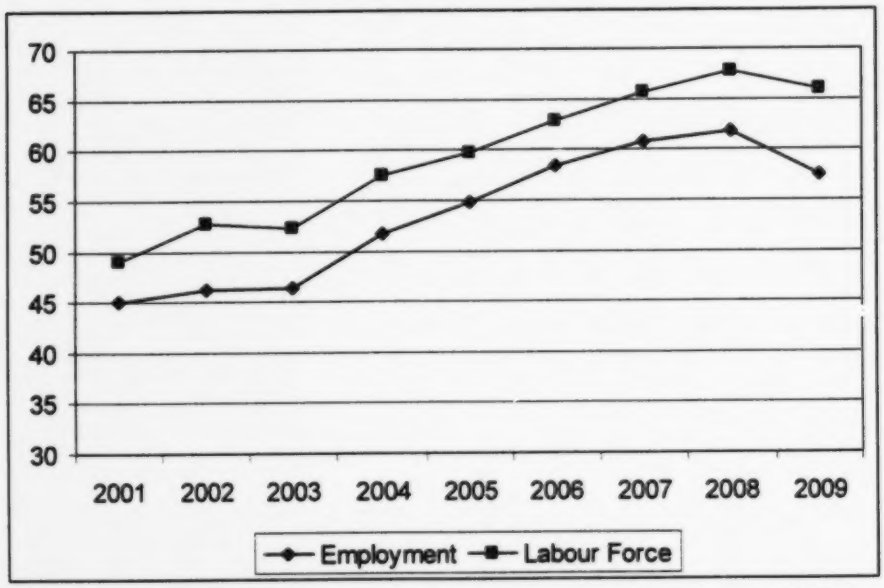
Forecasts of the labour force and employment along with the excess supply rate for the trades working in the construction industry are presented in Table 4.2. For example, in 2005, the plumber force in the construction industry is 5,881, employment is 5,525 and the excess supply rate is 6.1 percent – the latter measure states that 6.1 percent of the electrician labour force was not working on average during the year. The "% Change" rows in the table refer to the annual percentage change in either the labour force or employment.

The table does not include the trades that work in other industries in the province such as in manufacturing or mining.

The negative excess supply rates in the table such as that for boilermakers in 2005 indicate that the demand for boilermakers in the construction industry exceeds the supply of boilermakers in the construction industry. This result does not mean that additional boilermakers cannot be obtained to meet demand, only that employers will need to look outside the construction industry - where many boilermakers are employed - or outside of the province to find them.

Figure 4.1 shows employment and labour force for the CWDFC trades as a whole. Employment and labour force in the construction industry grew rapidly in 2004. While growth is predicted to slow in 2005, both employment and labour force increase significantly from 2005 to 2008, before falling in 2009. Labour force growth exceeds that of employment after 2006 – labour force growth generally lags employment growth as supply attempts to keep up with demand growth.

Figure 4.1
Employment and Labour Force
CWDFC Trades as a Whole
Construction Industry, 2001-2009



Source: Statistics Canada, Construction Sector Council and CWDFC

As can be seen from Table 4.2, the increases in employment requirements differ across trades. For many trades, the largest increase in the employment occurs in 2006. For some trades such as boilermakers, insulators and crane operators the increase in 2007 is larger than that in 2006.

Trade demand slows in 2008 and for some trade categories there is a decline in requirements. In 2009, there is a decline in demand for almost all trades as investment expenditures decline.

Table 4.2
Employment, Labour Force and Excess Supply Rates

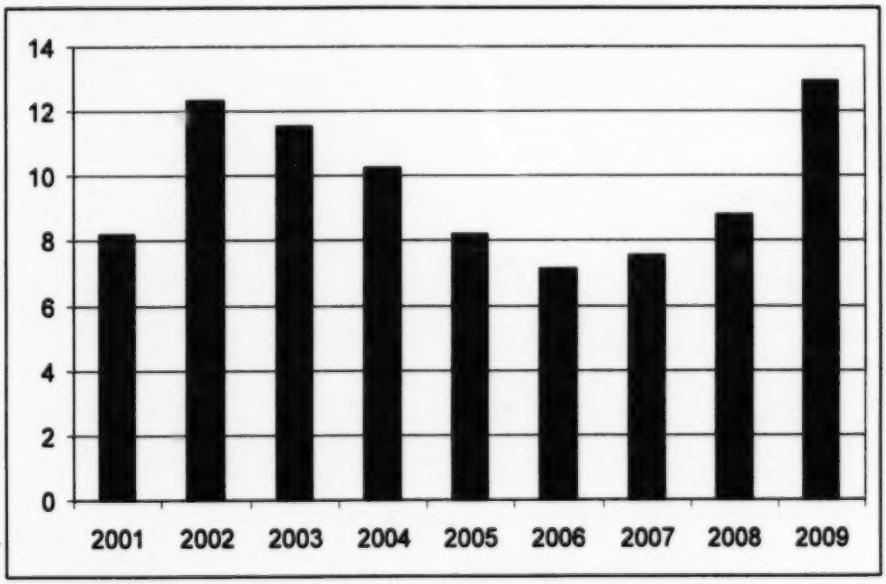
	2005	2006	2007	2008	2009
Plumbers					
Labour Force	5881	6320	6613	6769	6751
% Change	5.4	7.5	4.6	2.4	-0.3
Employment	5525	5980	6162	6170	6006
% Change	8.2	8.2	3.1	0.1	-2.7
Excess Supply Rate	6.1	5.4	6.8	8.8	11.0
Steamfitters and pipefitters					
Labour Force	3037	3557	3884	4088	4007
% Change	12.6	17.1	9.2	5.3	-2.0
Employment	2923	3498	3655	3729	3462
% Change	20.1	19.7	4.5	2.0	-7.2
Excess Supply Rate	3.8	1.7	5.9	8.8	13.6
Carpenters					
Labour Force	14918	14954	15105	15737	15539
% Change	-1.9	0.2	1.0	4.2	-1.3
Employment	13432	13598	13853	14631	13851
% Change	-1.9	1.2	1.9	5.6	-5.3
Excess Supply Rate	10.0	9.1	8.3	7.0	10.9
Bricklayers					
Labour Force	1033	1000	1023	927	937
% Change	-3.7	-3.1	2.2	-9.3	1.0
Employment	911	882	938	779	840
% Change	-2.6	-3.2	6.3	-16.9	7.8
Excess Supply Rate	11.7	11.8	8.3	16.0	10.3
Insulators					
Labour Force	2113	2335	2672	2617	2608
% Change	14.6	10.5	14.4	-2.0	-0.3
Employment	1901	2106	2469	2164	2167
% Change	18.1	10.8	17.3	-12.4	0.1
Excess Supply Rate	10.0	9.8	7.6	17.3	16.9
Electricians (except industrial and power system)					
Labour Force	8839	9249	9506	9714	9579
% Change	1.9	4.6	2.8	2.2	-1.4
Employment	8097	8584	8744	8839	8456
% Change	3.0	6.0	1.9	1.1	-4.3
Excess Supply Rate	8.4	7.2	8.0	9.0	11.7
Industrial electricians					
Labour Force	2020	2352	2580	2724	2569
% Change	16.0	16.5	9.7	5.5	-5.7
Employment	1901	2283	2415	2467	2145
% Change	16.4	8.4	12.0	6.7	-17.3
Excess Supply Rate	5.9	2.9	6.4	9.4	16.5

Construction Industry, 2005-2009
Table 4.2 - Continued

	2005	2006	2007	2008	2009
Sheet metal workers					
Labour Force	2177	2356	2600	2825	2617
% Change	15.2	8.3	10.3	8.6	-7.4
Employment	2017	2186	2447	2611	2160
% Change	59.9	-1.8	33.2	-62.7	63.0
Excess Supply Rate	7.4	7.2	5.9	7.6	17.5
Boilermakers					
Labour Force	370	411	509	308	339
% Change	32.1	11.1	23.8	-39.5	10.2
Employment	389	382	509	190	309
% Change	59.9	-1.8	33.2	-62.7	63.0
Excess Supply Rate	-5.3	7.0	-0.1	38.4	8.9
Ironworkers					
Labour Force	1714	2176	2382	2455	2311
% Change	27.6	27.0	9.5	3.1	-5.9
Employment	1720	2165	2152	2117	1863
% Change	43.5	25.9	-0.6	-1.7	-12.0
Excess Supply Rate	-0.4	0.5	9.6	13.8	19.4
Welders					
Labour Force	2862	3089	3171	3269	3109
% Change	8.3	7.9	2.7	3.1	-4.9
Employment	2599	2877	2865	2941	2633
% Change	11.4	10.7	-0.4	2.6	-10.5
Excess Supply Rate	9.2	6.9	9.6	10.0	15.3
Construction millwrights					
Labour Force	684	726	730	629	597
% Change	12.1	6.2	0.5	-13.8	-5.1
Employment	644	679	660	510	513
% Change	18.1	5.6	-2.8	-22.7	0.6
Excess Supply Rate	5.9	6.5	9.5	18.8	14.0
Heavy equipment operators (except crane)					
Labour Force	6552	6668	6729	6764	6508
% Change	-6.3	1.8	0.9	0.5	-3.8
Employment	5751	6189	6251	6235	5795
% Change	-4.9	7.6	1.0	-0.2	-7.1
Excess Supply Rate	12.2	7.2	7.1	7.8	10.9
Crane operators					
Labour Force	1278	1486	1757	1946	1793
% Change	22.3	16.3	18.2	10.7	-7.9
Employment	1292	1445	1731	1821	1474
% Change	30.0	11.8	19.8	5.2	-19.1
Excess Supply Rate	-1.1	2.8	1.5	6.4	17.8
Construction trades helpers and labourers					
Labour Force	12747	12905	13161	13808	13286
% Change	-1.3	1.2	2.0	4.9	-3.8
Employment	11431	11756	12114	12877	11627
% Change	0.3	2.8	3.0	6.3	-9.7
Excess Supply Rate	10.3	8.9	8.0	6.7	12.5
Source: Construction Sector Council and CWDFC					

The tightness of the labour market for the trades as measured by the excess supply rate for the CWDFC trades as a whole is shown in Figure 4.2. The excess supply rate for the trades tightens sharply to 2006 falling below the rate achieved at the peak of non-residential construction activity reached in 2001 when the excess supply rate fell to 8 percent.

Figure 4.2
Excess Supply Rate (%)
CWDFC Trades as a Whole, Construction Industry, 2001-2009



Source: CWDFC

As labour force growth begins to exceed employment growth after 2006, the excess supply rate rises over the remainder of the forecast period. The sharp increase in 2009 reflects the large reduction in employment in that year.

For many of the trades it will be difficult, if not impossible, to source sufficient workers from the construction industry. These trades include pipefitters, industrial electricians, boilermakers, ironworkers and crane operators. Contractors will be forced to attract workers from other industries in the province as well as workers from outside the province.

5. Supply-Demand Balance Assessment

This section presents the CWDFC assessment of the supply-demand situation for the trades. The first part of the section looks at the workers available from other industries and provinces in the country to meet the needs of the construction industry. The other part of the section presents the CWDFC assessment.

When examining the possible source of workers from other industries in the province or from workers outside the province, it is important to keep in mind the likely mobility of the workers. It may not be possible to get workers in other industries to work in construction either because they lack the required skills or they simply do not wish to work in construction. The same situation exists for workers in other provinces with the additional issue of whether they wish to move to the province.

Excess Supply in Other Industries and Provinces

Table 5.1 shows estimates of excess supply in other industries in the province for the subset of trades found above where it will be difficult to find workers in the construction industry. The numbers for the construction industry refer to the excess supply at peak levels of construction activity – in the summer. The latter measure is employed, since it is the peak that is the major concern to the construction industry. The excess supply rate at peak shown in the table refers to the construction and other industries combined. It is measured as a percentage of the combined labour force.

An example of the measures in the table is for Boilermakers in 2005. In the construction industry there is a shortage of 33 workers at the peak period of construction. In other industries, there are 25 workers not working during the year on average. Adding these two numbers together yields a shortage of 8 workers at the peak construction period. This total represents -0.7 percent of the combined labour force of the construction and other industries in the province. That is, at peak activity, the excess supply rate for all industries combined is -0.7 percent.

The excess supply values for trades available in other industries in the table suggest some help in meeting the needs of the trades mentioned above – pipefitters, industrial electricians, boilermakers, ironworkers and crane operators. While the addition of workers from other industries could increase the excess supply rate for some of these trades over the next couple of years, the excess supply rates are still extremely low. The strong growth in employment in the other industries in the province does not provide sufficient excess workers to meet the needs of the construction industry.

The Construction Sector Council is just completing an analysis of the supply-demand situation for construction trades across the country. While the analysis is not complete, an indication of the tightness of the labour market for the trades is shown in Table 5.2 based on preliminary results. This table shows ranges of excess supply rates for the country as a whole for the five trades of concern for the period 2005 to 2007. The excess supply rates for the construction industry in Table 5.2 are measured at peak periods of construction activity.

Table 5.1
Excess Supply and Rates (%)
Construction and Other Industries, Selected Trades, 2005-2009

	2005	2006	2007	2008	2009
Steamfitters and pipefitters					
Excess Supply Construction (Peak)	30	-45	127	263	466
Excess Supply Other Industries	94	107	69	94	112
Total Excess Supply (Peak)	124	62	197	357	578
Excess Supply Rate (Peak)	2.1	0.9	2.8	4.9	8.0
Industrial electricians					
Excess Supply Construction (Peak)	66	2	100	194	380
Excess Supply Other Industries	63	73	47	65	77
Total Excess Supply (Peak)	129	75	147	259	457
Excess Supply Rate (Peak)	3.2	1.7	3.1	5.3	9.6
Boilermakers					
Excess Supply Construction (Peak)	-33	18	-16	118	22
Excess Supply Other Industries	25	28	20	26	30
Total Excess Supply (Peak)	-8	46	4	144	53
Excess Supply Rate (Peak)	-0.7	4.0	0.3	13.5	4.7
Ironworkers					
Excess Supply Construction (Peak)	-59	-55	174	290	413
Excess Supply Other Industries	43	44	30	37	42
Total Excess Supply (Peak)	-16	-11	204	328	455
Excess Supply Rate (Peak)	-0.6	-0.3	5.9	9.2	13.2
Crane operators					
Excess Supply Construction (Peak)	-55	-1	-26	75	289
Excess Supply Other Industries	35	37	25	32	38
Total Excess Supply (Peak)	-20	36	-1	107	327
Excess Supply Rate (Peak)	-0.9	1.5	0.0	3.6	11.6
Source: Construction Sector Council and CWDFC					

As can be seen from the table, the market for industrial electricians, boilermakers, and crane operators in the construction industry is likely to be tight over the next couple of years. Nevertheless, excess workers appear to be available across the country to help meet Alberta's needs. This is only true, however, if the Alberta construction industry is able to attract the excess workers in "both" the construction and other industries to come and work in Alberta in the locations where they are needed, and assuming these workers possess the required skills.

Table 5.2
Ranges of Excess Supply Rates (%)
Selected Trades, Canada, 2005-2007

Trade/Range	Range (Percent)
Steamfitters and Pipefitters	
Construction Industry	4.0 to 5.5
Other Industries	6.5 to 8.0
Industrial Electricians	
Construction Industry	2.5 to 4.0
Other Industries	6.0 to 6.5
Boilermakers	
Construction Industry	0.5 to 3.0
Other Industries	7.5 to 9.0
Ironworkers	
Construction Industry	5.5 to 9.0
Other Industries	9.5 to 11.5
Crane Operators	
Construction Industry	2.5 to 3.5
Other Industries	6.0 to 7.0
Source: Construction Sector Council	

Trades Assessment

The data used for the trades is derived from benchmarks from the Census of Canada. There is a feeling among CWDFC members that some of the measures created using these data are not always accurate. In addition, trades are aggregated across construction sectors. They do not always reflect what is happening in the construction workplace.

As a result, a rating system has been adopted that supplements the excess supply measures with information from the marketplace. Based on discussions with people in the construction industry, CWDFC members have rated the trades in terms of perceived shortages. In this case, the rating may differ from what is indicated by the excess supply measures. The rating categories are numbered as follows:

1. A shortage is expected on almost all projects for most of the construction season;
2. A shortage is expected on almost all projects for peak periods of construction;
3. There may be shortages of these workers from time to time as a result of coinciding project schedules; and
4. Shortages are not likely to occur for this trade.

Table 5.3 shows the rankings for the CWDFC construction trades. There is a number of trades ranked 2 for the next couple of years, which indicates that there will likely be shortages for them during peak periods of construction. These trades include those trades identified above, as well as carpenters and welders. In the case of carpenters it is really scaffolders that will be difficult to find, since the market for carpenters in the residential sector will ease during this period. In the case of welders, it is B pressure and specialty welders that will be in short supply.

In 2009 any shortages will have disappeared as employment in the construction industry declines in response to a reduction in investment expenditures.

Table 5.3
CWDFC Trades Rankings

Trade/Year	2005	2006	2007	2008	2009
Boilermakers	2	3	2	4	3
Bricklayers	3	3	3	4	4
Carpenters	3	3*	3*	3*	4
Construction Millwrights	3	3	2	3	3
Construction Trades Helpers and Labourers	4	3	3	3	4
Crane Operators	2	2	2	3	4
Electricians (except industrial and power system)	3	3	3	3	4
Heavy Equipment Operators (except crane)	3	3	3	3	3
Industrial Electricians	3	2	3	3	4
Insulators	3	3	3	4	4
Ironworkers	2	2	3	4	4
Plumbers	3	2	3	3	4
Sheet Metal Workers	3	3	3	3	4
Steamfillters and Pipefitters	3	2	2	3	4
Welders and Related Machine Operators	3	2	2	3	3
* Scaffolders, which are a subset of carpenters, are ranked 2 for these years.					

6. Conclusion

Running a forecasting model requires inputting reams of data into a computer program, which then analyzes literally thousands of factors to arrive at a computer generated forecast. Numerous people familiar with the economic conditions in the region and the industry must then review this forecast to finally arrive at a report. In order to accomplish this task we must establish a cut-off point where we freeze the data input and run the model based on the information we have at that time.

Because Alberta is dealing with multiple mega projects, in a scenario that is unquestionably unique in the world at this time, we are faced with project announcements that can have a dramatic impact between the date at which we "freeze" the data input and the time we publish this report. We have seen several billion dollars worth of major project announcements since the data input was frozen in late January of this year. Almost all of these announced projects are scheduled to be developed between late 2006 and 2009, which is the period in time we see the most concern over worker supply. Moreover, we have also seen announcements of possible project delays such as that of the MacKenzie Valley Pipeline, which may face delays in starting up due to issues over land rights with native groups in the Territories. Even if that project is delayed, what appeared to be a difficult situation with respect to tight labour supply over the next three years, may turn into one in which we cannot meet the demand based on historical trends of worker mobility, participation rates, and so on.

The current forecast, of course, is one based on a simulated economy in a computer-generated model. In the real world economic factors will come into play that will change these outcomes. The laws of supply and demand will cause costs for labour, material, and equipment to increase, with the result that the economic viability of certain projects will be re-examined. These impacts will almost certainly result in changes to schedules, the scope of projects, or it could also result in contingency plans being implemented which could significantly impact the way major construction projects are handled in Alberta in the future.

These contingencies could include such strategies as:

1. Importing temporary foreign workers to work on Alberta projects;
2. Diverting work on elements of a project to facilities outside of the construction industry in Alberta (e.g. modular fabrication) or divert a portion of the scope of a project to be built outside of Alberta or Canada (e.g. mine in Alberta - upgrade elsewhere); or
3. Implementation of innovative techniques to attract and retain workers to come and work on Alberta projects particularly in remote areas.

The large-scale importation of temporary foreign workers is a contingency that has been seriously contemplated in the past, but has thus far not been resorted to in the Alberta construction industry. Even during our last period of extremely tight labour markets in 2001 there were serious concerns about the practicality of utilizing that option. This

outcome may not be the situation in the next few years, however, as several construction owners have already taken preliminary steps to pave the way for bringing foreign workers in to work on their projects. This action is generally regarded as a "last resort" as it involves a high cost of transportation of workers as well as potential language and cultural issues depending on the country from which workers are imported.

Regarding the second option mentioned above, which involves diverting work outside of Alberta – for example, mining oil sands in Fort McMurray and transporting the bitumen elsewhere to be upgraded – the viability of this option is one which we as a Committee do not feel qualified to comment on. Suffice it to say this option must come with its own set of significant challenges or it would likely have been utilized more frequently. On the other hand modularization of construction elements is becoming more and more prevalent. This approach makes sense on a number of fronts. From a labour supply standpoint it will become increasingly difficult to attract workers to remote projects. Therefore bringing the work to larger centers where there is a large domestic supply of labour will become an increasingly attractive option. Ironically the presence of more of these jobs in large urban areas will make it even more difficult to attract workers to remote sites to perform the work that must be done on site.

The Forecasting Committee recommends that the industry expend considerable resources researching the third option mentioned above. That is to investigate innovative methods of attracting and retaining workers, particularly for northern projects. Supporting this recommendation is a study, commissioned by the Construction Sector Council, which will be released at approximately the same time as this Forecast Report, entitled "Working Mobile; A Study of Labour Mobility in Canada's Industrial Construction Sector". This report will suggest that it takes considerable resources to attract and retain a worker to work on a remote site away from his or her home, family, and friends. It will also suggest that there is only a relatively small subset of the construction industry that are prepared to "work mobile" on a regular basis, and that generally these workers only do so out of financial necessity.

The Working Mobile report confirms what many of us believed through anecdotal evidence; that in order to domestically meet the demand for workers on remote projects, such as those planned for the Fort McMurray region, there has to be a significant surplus of workers available in Alberta and the rest of Canada. This requirement is due to the fact that there are only a small proportion of those available workers who will be willing to temporarily relocate to work in that area, and the majority of them will only do so if they see it as a significant financial benefit. Also they will only be retained on remote sites for as long as they perceive this financial benefit significantly exceeds that which they would be able to earn closer to home.

This situation leads us to believe that, although the forecast suggests that the supply of workers, while tight, will be able to meet most of the demand for most of the trades with shortages only occurring at peak periods, we may be over-estimating the number of workers who will actually be prepared to "work mobile" on remote northern sites. This, combined with the number of recently announced mega projects as discussed earlier,

suggests that unless we are able to develop innovative ways of attracting workers to these sites and retaining them, we may be facing even more shortages on these remote projects than is forecast in this report. Hence our recommendation that the Workforce Development Committee work closely with other affected groups, such as the Regional Issues Working Group to look at issues around attracting and retaining workers on Northern (remote) projects as well as maintaining industry efforts to promote those initiatives that have been successful in workforce development in the past.

Appendix

Project Background

In the mid-1990s, the Construction Owners Association of Alberta (COAA) and a number of other organizations were anticipating a rapidly rising level of capital expenditure investment for the years ahead. To undertake the planned investment, a significant increase in the number of industrial construction activities and related workers would be required. To assist with the efficient delivery of the increased construction activities and obtaining the required workers, the CWDFC Demand and Supply Forecast project was undertaken.

The development of an outlook for the supply of and demand for construction workers in Alberta is one of several projects being conducted under the auspices of the COAA Workforce Development initiative. Other projects include participation in the provincial government's review of the Apprenticeship system in Alberta, an assessment of needs for help with essential basic skills in the construction workplace and the promotion of construction as a viable career for young Albertans.

All of the Workforce Development Committee's projects link to an overarching vision and a set of goals that guide achievement of this vision. Their vision is that the Alberta construction industry has access to a workforce with:

- The right skills;
- The right mix;
- At the right time; and
- In the right numbers.

The goals guiding achievement of the vision are:

- Predicting the workforce requirements in the medium term (5 years) and development of strategies to address them;
- Creating an environment that attracts and retains skilled workers;
- Creating and maintaining a skilled and flexible workforce; and
- Encouraging collaborative relationships in the workplace.

The development of the annual 5-year outlook for workforce supply and demand is a major step towards achieving this vision.

Project Scope

The scope of the effort undertaken is to develop a supply/demand outlook for industrial-related construction workers in Alberta for a five-year period and to present a report that addresses the following questions:

- What will be the demand for industrial-related construction occupations for the next five years?

- What will be the supply of workers by occupation for the period?
- What will be the supply/demand balance for each specific occupation for this period; and
- What can we do as an industry to collaboratively address any projected imbalances?

Project Participants and Funding

The outlook was developed under the direction of the Construction Workforce Development Forecasting Committee (CWDFC). This committee is the result of a collaborative effort involving the Construction Owners Association of Alberta, Alberta Economic Development, Alberta Advanced Education, Alberta Human Resources and Employment, and major representatives of Alberta construction contractors and labour organizations. The COAA, the Alberta government, and various organizations in the Alberta Construction Industry provide funding for the project.

The members of the CWDFC are as follows:

Herb Holmes	Construction Labour Relations – Alberta (Chair)
Bill Stewart	Merit Contractors Association of Alberta
Gary Mullaly	Syncrude Canada
Gina Wong	Alberta Apprenticeship and Industry Training
Kathy Dumaresq	Alberta Economic Development
Patricia Armitage	Alberta Economic Development
Ken Gibson	Alberta Construction Association
Lori Miller	Kiewit Industrial Construction
Michele Spak	Alberta Apprenticeship and Industry Training
Mike Lam	Alberta Advanced Education
Ron Harry	Alberta Building and Construction Trades Council
Dan Hodgson	Alberta Human Resources and Employment
Ernie Stokes	Centre for Spatial Economics (Project Consultant)
Sam Patayanikorn	Centre for Spatial Economics (Project Consultant)